ASSIGNMENT 2

Textbook Assignment: "Layout and Fabrication of Sheet Metal and Fiber-glass Duct," pages 2-1 through 2-39.

Learning Objective: Identify the tools and equipment needed for measuring and fabricating sheet metal and recognize their uses.

2-1. The procedure for measuring and marking material for the cutting, drilling, and/or welding of metal is known by the term "layout."

1. True
2. False

2-2. What type of tool is most frequently used to scribe lines on sheet metal?

1. Prick punches
2. Trammel points
3. Scratch awls
4. Dividers

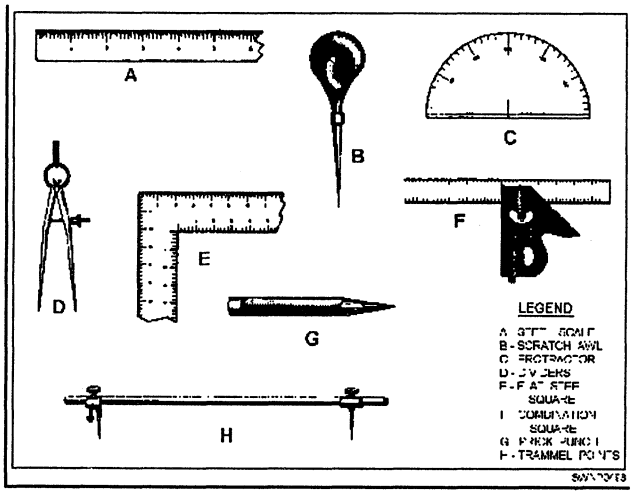

Figure 2A

IN ANSWERING QUESTIONS 2-3 THROUGH 2-6, REFER TO FIGURE 2A.

2-3. To construct parallel lines in layout work, you should first clamp tool A to the base line of your work. What other tools in figure 2A do you need to complete the job?

1. D and C
2. C and G
3. B and E
4. A and D

2-4. You need to draw a line that cuts the base line of your layout work at an angle of 45 degrees. Of the tools in the figure, which one is quickest and easiest to use in constructing this angle?

1. C
2. D
3. E
4. F

2-5. What layout tool should you use to mark a point on your work?

1. B
2. D
3. G
4. H

2-6. Which of the tools is required to scribe a circle having a radius of 22 inches?

1. B
2. C
3. D
4. H

2-7. To construct a right angle by bisecting a base line, you must set the dividers for what distance?

1. To exactly one half of the length of the base line
2. To less than one half of the length of the base line
3. To more than one half of the length of the base line
4. Equal to the length of the base line

2-8. In a simple drip pan layout, the radius of a corner arc is equal to what dimension of the pan?

1. Its depth
2. Its length
3. Its width
4. Its diagonal cross section

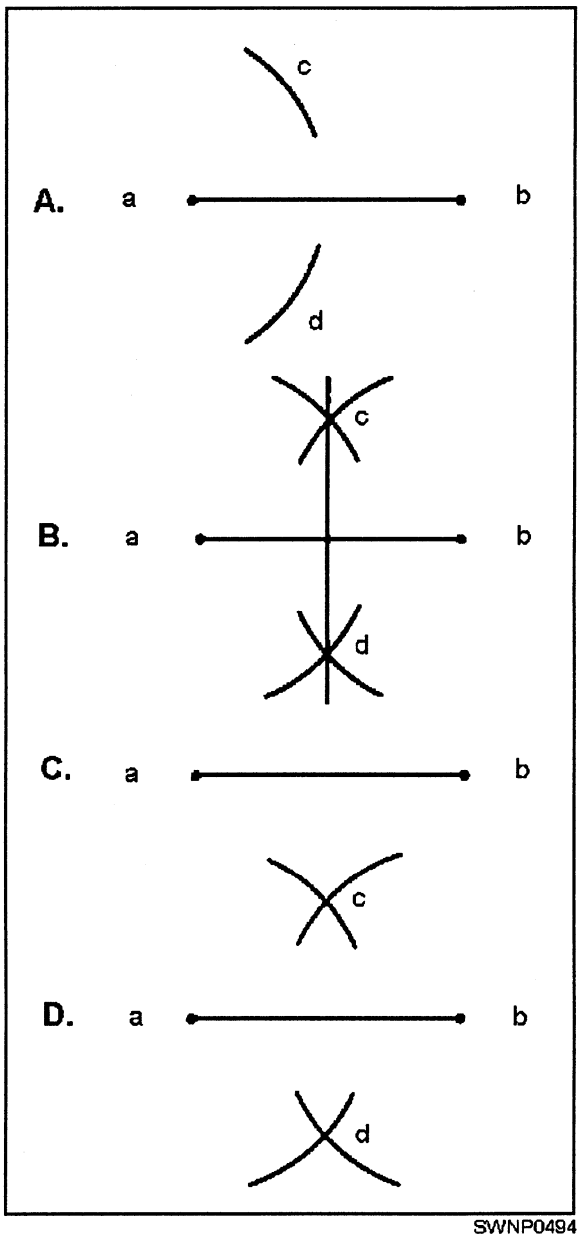

Figure 2B

IN ANSWERING QUESTION 2-9, REFER TO FIGURE TO FIGURE 2B.

2-9. To construct a 90 degree or right angle using steps A through D shown in the figure, you should perform the steps in what sequence?

1. A, B, C, D
2. B, C, A, D
3. C, A, D, B
4. D, B, C, A

2-10. Refer to figure 2-11 in the textbook. To find point F in bisecting angle ABC, you must set the dividers for what distance?

1. To less than one half of the line BD
2. To twice the length of EB
3. To greater than the total length of arc DE
4. To greater than one half of the length of arc DE

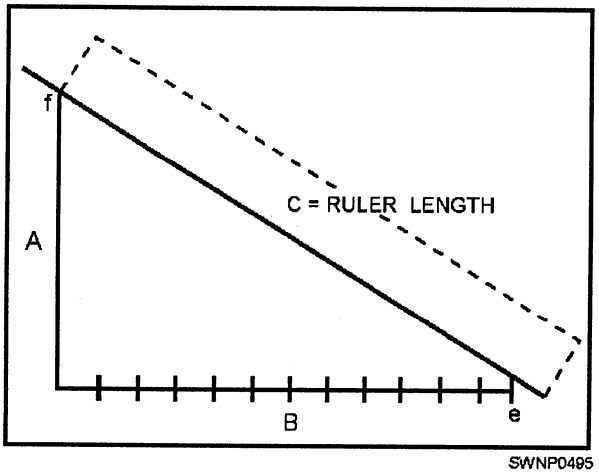

Figure 2C

IN ANSWERING QUESTIONS 2-11 THROUGH 2-13, REFER TO FIGURE 2C.

2-11. Base line B is 10 inches long and you want to divide it into 12 equal parts. Using a rule after drawing line A perpendicular to the base line, you should orient the ruler in which of the following ways?

1. Set the 12-inch mark at (e) and the 0-inch mark at (f)
2. Set the 12-inch mark at (e) and the l-inch mark at a point 4 1/2 inches above (d)
3. Set the 9-inch mark at the midpoint of base line B and the 3-inch mark at the mid-point of line A
4. Set the 9-inch mark at the midpoint of line A

2-12. Your next step in dividing base line B into equal parts is to drop perpendiculars to B from what mark on the ruler?

1. 1 inch
2. 3/4 inch
3. 1/2 inch
4. 1/4 inch

2-13. After line B is divided into 12 equal parts, what is the approximate length of each part?

1. 5/16 inch
2. 7/16 inch
3. 13/16 inch
4. 15/16 inch

2-14. You set dividers for the radius of a circle and strike off this distance on the entire circum-ference. Into how many equal arcs have you divided the circumference?

1. Six
2. Two
3. Three
4. Nine

2-15. Into how many equal parts is the circumference of a circle divided if the lines intersecting at the center of the circle form angles of 30 degrees?

1. 4
2. 6
3. 12
4. 18

2-16. What is the approximate circum-ference of a circle that has a diameter of 18 inches?

1. 45.5 inches
2. 56.5 inches
3. 133.0 inches
4. 365.0 inches

2-17. What is the mathematical formula for determining the area of the stretchout of a cylinder?

1. $A = \pi r$
2. $A = \pi rd$
3. $A = 2\pi r$
4. $A = (\pi d)h$

Learning Objective: Identify uses and operation of tools and equipment used in fabricating sheet metal.

IN ANSWERING QUESTIONS 2-18 THROUGH 2-20, SELECT FROM COLUMN B THE TYPE OF SNIPS THAT SHOULD BE USED TO MAKE THE CUTS IN COLUMN A.

	A. CUTS	B. TYPES OF SNIPS
2-18.	Outside circles	1. Circular
	1. 1 2. 2 3. 3 4. 4	2. Aviation 3. Hawkbill 4. Beakhorn
2-19.	Compound curves and intricate designs	
	1. 1 2. 2 3. 3 4. 4	
2-20.	Internal openings, such as rings or holes	
	1. 1 2. 2 3. 3 4. 4	

2-21. Squaring shears are designed to cut which of the following materials?

1. Wire rope
2. Steel rods
3. Sheet metal
4. Fiber line

2-22. Metal stakes are used to make an assortment of bends by hand and to finish many types of work.

1. True
2. False

IN ANSWERING QUESTIONS 2-23 THROUGH 2-25, SELECT FROM COLUMN B THE TYPE OF STAKE THAT SHOULD BE USED TO FORM THE SHAPES IN COLUMN A.

	A. SHAPES	B. STAKES
2-23.	Forming, seaming, and riveting pieces and parts of pipe mandrel	1. Conductor 2. Hollow pipe 3. Blowhorn 4. Beakhorn
	1. 1 2. 2 3. 3 4. 4	
2-24.	Blunt and slender tapered jobs	
	1. 1 2. 2 3. 3 4. 4	
2-25.	Riveting and shaping round and square work	
	1. 1 2. 2 3. 3 4. 4	

2-26. What part of the bar-folding machine is used to make right angles and 45-degree bends?

1. The depth gauge
2. The bar handle
3. The wing
4. The angle stop

2-27. A total of how many adjustments must be made on a cornice brake before you can use the machine to bend sheet metal?

1. One
2. Two
3. Three
4. Four

2-28. What feature on the cornice brake enables you to make as many duplicate bends as required?

1. The clamping device
2. The balancing weight
3. The stop gauge
4. The mold clamps

2-29. The box and pan brake is often referred to as a finger brake.

1. True
2. False

2-30. When forming a curved shape, you can fabricate the most accurate bend by using what piece of equipment?

1. A stake
2. A mandrel
3. A pipe
4. A slip-roll forming machine

2-31. The slip-roll forming machine is designed to allow one end of the top front roll to be released quickly so you can perform what task easily?

1. Removal of the work
2. Cleaning operations
3. Repairs on the machine
4. Adjustments to the machine

2-32. What operation of the combination rotary machine is used to reduce the size of the end of a cylinder?

1. The beading
2. The burring
3. The crimping
4. The clamping

Learning Objective: Recognize the methods of pattern development and identify types of edges, seams, and notches used in fabricating sheet metal.

2-33. Instead of scribing directly on the metal when a single piece is being made in quantity, you can make a pattern or template and transfer it to the metal.

1. True
2. False

2-34. Assume that the cylinder shown in textbook figure 2-51 has a diameter of 8 1/2 inches. Excluding the seam, what is the length of the stretchout?

1. 26 5/8 inches
2. 38 3/4 inches
3. 51 7/8 inches
4. 61 5/8 inches

2-35. A patternmaker decides to divide a half plan or top view into 12 equal parts. What number of divisions will be required for the stretch-out line?

1. 6
2. 12
3. 24
4. 48

2-36. What method of pattern development should you use to develop a pattern for an object that has a tapering form with lines converging at a common center?

1. Radial line
2. Parallel line
3. Triangulation
4. Scratching

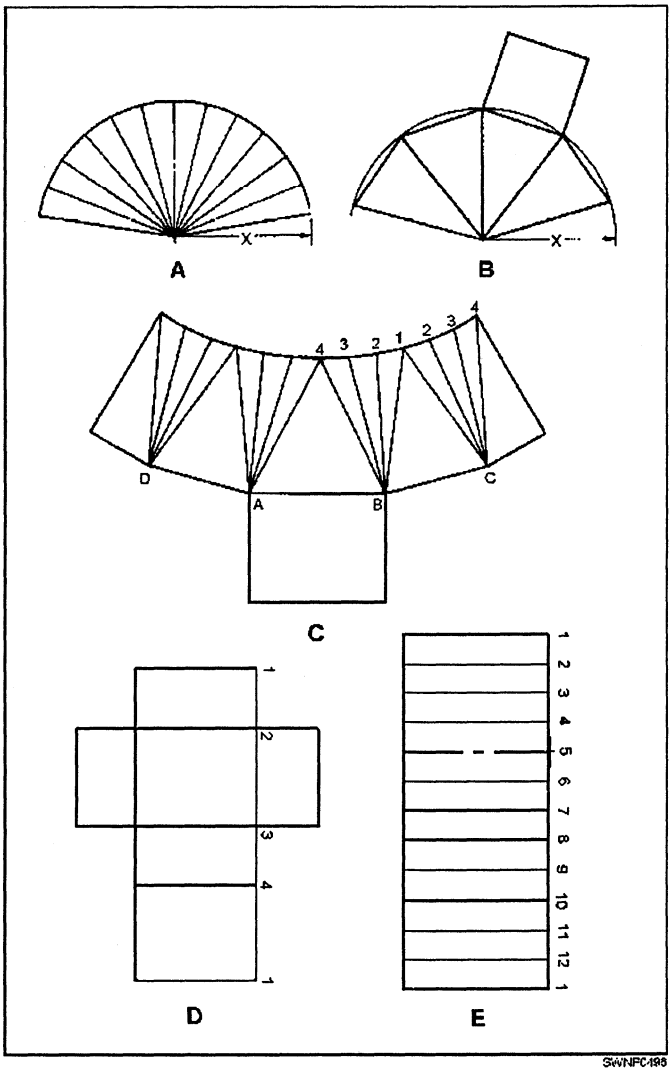

Figure 2D

IN ANSWERING QUESTIONS 2-37 THROUGH 2-39, REFER TO FIGURE 2D.

2-37. What stretchouts are developed by the radial-line method?

1. A and B
2. A and C
3. C and D
4. C and E

2-38. Triangulation is used to develop what pattern?

1. A
2. C
3. D
4. E

2-39. What pattern will ultimately fold or roll into a cylinder?

1. A
2. C
3. D
4. E

IN ANSWERING QUESTIONS 2-40 THROUGH 2-42, REFER TO FIGURE 2-52 IN THE TEXTBOOK.

2-40. The radial line method is used to develop a frustrum of a right cone.

1. True
2. False

2-41. The stretchout pattern of the frustrum has been stepped off into how many spaces?

1. 6
2. 7
3. 12
4. 14

2-42. The length of the numbered line on the stretchout from 1 to 1 is equal to what measurement?

1. Height of the frustrum
2. Circumference of the base of the cone
3. Radius of the top of the frustrum
4. Slant height of the frustrum

IN ANSWERING QUESTIONS 2-43 THROUGH 2-45, ASSUME THAT YOU ARE TO DRAW A PATTERN OF A TRANSITION PIECE FOR A SQUARE DUCT AND A SMALLER ROUND DUCT, AS SHOWN IN TEXTBOOK FIGURE 2-53.

2-43. What view of the transition piece should you draw first?

1. A
2. B
3. C
4. D

2-44. What triangle should you develop first in E?

1. B3 and 4
2. B4 and 5 or C7 and 8
3. D7 and 6
4. A2 and 1 or B2 and 1

2-45. You have constructed perpendicular bisectors of AB, BC, CD, and DA in E and have established the location of point 0_0. What step should you perform next in order to check the overall symmetry of your transition piece?

1. Swing length D5 from point 5
2. Swing an arc of radius A2 from point A
3. Swing arcs A and B from point O
4. Swing arcs from point G that will intersect at point O

Learning Objective: Identify the various sheet-metal joints and locking methods used in the fabrication of sheet-metal sections.

2-46. When fabricating a wired edge to a cylinder, you must add how much edging to a pattern?

1. 1 1/2 times the thickness of the metal
2. 2 1/2 times the diameter of the wire to be used
3. Twice the diameter of the upper burring roller
4. One half of the diameter of the wire to be used

2-47. In the fabrication of rectangular duct, what seam is used most often?

1. Grooved
2. Pittsburgh lock
3. Lap
4. Standing

2-48. When laying out a pattern, you consider what feature last?

1. Seams
2. Laps
3. Notches
4. Edges

2-49. What type of notch is used on a corner when a single-hemmed edge is to meet a 90-degree angle?

1. Square
2. Slant
3. V
4. Wire

2-50. What type of connection is used to join a flat sheet and a round pipe/fitting?

1. Dovetail seam
2. Drive slip
3. Pocket slip
4. Standing seam

Learning Objective: Identify the various joints, installation procedures, metal requirements, and connections used in sheet-metal duct systems.

2-51. What type of screw is most often used in sheet-metal work?

1. Self-tapping
2. Machine
3. Thread-cutting
4. Drive

2-52. Drive screws are simply driven into sheet metal.

1. True
2. False

2-53. Tinners are designated by their weight per 1,000 rivets.

1. True
2. False

2-54. The distance from the center of the rivet to the edge of the sheet must equal how many rivet diameters?

1. 1
2. 1 1/2
3. 2
4. 2 1/2

2-55. The correct method for riveting using tinner rivets is to draw, upset, and head the rivet.

1. True
2. False

2-56. What gauge of aluminum sheet metal is required to construct a duct 62 inches wide at the top and 28 inches high on the sides?

1. 26
2. 24
3. 18
4. 16

2-57. You are to construct a duct of 24 gauge sheet metal. Each section is 7 feet 10 inches long. If the total system length is 60 feet, you should place the bracing angles at what location?

1. 2 feet on center along the length of the duct
2. 4 feet on center along the length of the duct
3. 2 feet from each joint
4. 4 feet from each joint

2-58. The cross breaking of a duct having a flat side of 18 inches or greater can be omitted under which of the following conditions?

1. The duct is installed in the vertical position
2. The material used is at least reinforced at the edges of each duct segment
3. The duct is insulated with approved materials
4. The duct is insulated with rigid insulation and the sheet metal used is 2 gauges heavier

2-59. When securing duct systems to heating and cooling units, you should use what material to fabricate the flexible connections?

1. Light-gauge sheet metal
2. Asbestos
3. Heavy canvas
4. Aluminum

2-60. When “S” slips and drive slips are used on a duct system, you lock the joint into position in what way?

1. By bending the “S” slip over the drive slip
2. By bending the drive slip over “S” slip
3. By cutting off the drive slip even with the “S” slip and welding each corner
4. By center punching the “S” slip

Learning Objective: Identify material requirements, fabrication, and installation procedures used in fiber-glass duct systems.

2-61. Fiber-glass duct has which of the following advantages?

1. Added insulating value
2. Ease of fabrication and handling
3. Ease of installation
4. Each of the above

2-62. In all applications, the inside diameter is the determining factor of the duct size.

1. True
2. False

2-63. Fiber-glass duct must not be used in a heating system in which the heat generated exceeds what temperature?

1. 150°F
2. 200°F
3. 250°F
4. 300°F

2-64. What are the dimensions of the galvanized steel straps used to support fiber-glass duct?

1. 3/4-inch diameter by l/8-inch thick
2. l-inch diameter by l/8-inch thick
3. l-inch diameter by l/16-inch thick
4. 1 l/8-inch diameter by 1 l/16-inch thick

2-65. You have fabricated a fiber-glass duct system that has a 30-inch diameter. At what distance should the supports be placed?

1. 6-foot centers
2. 2-foot centers
3. 8-foot centers
4. 4-foot centers